Governor's STEM Advisory Council
Regional STEM Network Hub
Application

April 5, 2012

Southeast Region

South East Alliance for Modeling, Leading and Educating STEM Students

Name of proposed requesting entity (or entries as partners):
South East Alliance for Modeling, Leading and Educating STEM Students-SEAMLESS

Name and title of primary contact:
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Region:
Southwest (*Southeast)*

Proposed Location:
The location of the Regional STEM Network Hub will be in Eastern Iowa Community Colleges new Interactive Learning Lab located in downtown Davenport, Iowa. The EICCD Interactive Learning Lab is located on the first floor of the Mississippi Plaza Building in downtown Davenport and houses the ATEEC offices, the Interactive Learning Lab, as well as classrooms to educate students and the general public about sustainable energy technologies. The Interactive Learning Lab helps anchor and enhance the existing downtown "educational corridor" for K-12 students. Within a two block area of the proposed Interactive Learning Lab resides the Figge Art Museum, The River Music Experience, the Davenport Library and Junior Achievement. The Interactive Learning Lab will works schools to provide hands-on, activity-based learning activities in the STEM areas and professional development for teachers so that they are proficient in teaching and working with these technologies. More than one million dollars in interactive exhibits ($1,156,899.00) have been fabricated and installed in the Lab.

We have five long term goals for the Interactive Learning Lab. They are:
• Enhance the existing outstanding educational corridor in downtown Davenport.
• Assist teachers in career awareness and the preparation of a pipeline of the K-12 STEM (science, technology, engineering and math) students.
• Prepare community college graduates for the ever-changing environmental and energy related workforce.
• Be a catalyst and assist in economic development efforts to bring new industry to the area.
• Showcase our robust local business and industry innovation and entrepreneurial spirit.

EICC staff has been diligently working with teachers and curriculum specialists from K-12 schools on both sides of the river. We have worked with a total of 31 schools/Districts in Illinois and 18 schools/Districts in Iowa. One of the main foci of these interactions is to capture the needs of the teachers and make sure that the curricula tie directly to the classroom and state standards.
The Interactive Learning Lab also serves the needs of higher education by focusing, promoting and

providing curriculum for related careers. A reserved 'Local Leaders' section of the Interactive Learning Lab serves as a venue for local business and industry to promote and educate about new innovations and collaborate with entrepreneurs in the energy technologies sector. Local Leaders to date include Exelon Nuclear Energy, Deere and MidAmerican Energy. It is the intent of the Interactive Learning Lab to be a tool for economic development and workforce preparation for the community.

Community colleges are at the forefront of this growing momentum due to their impact on the workforce, their connections to local and regional labor markets, and their flexibility to quickly respond to emerging industries and changing skill needs. The majority of new green occupations will be transformed from existing jobs, requiring a redefinition of skill sets, methods, and occupational profiles, something community colleges excel at providing. Therefore some emerging green occupations will require the creation of new industry-recognized credentials and training programs, and many will only require modifications to existing programs and courses to integrate green skills. Community colleges are strategically positioned, with regional partnerships, to redefine skills and competencies needed by the green workforce, and to support professional development in these evolving occupational fields. But interest in the science, technology, engineering and math (STEM) subjects that will be needed in renewable energy and green jobs must start in the earlier grades. The National Center for Education Statistics released study results that found American fourth graders have shown no gains in science since 1995. According to the National Commission on Math and Science, it is not just the role that math, science, and technology play in a changing economy and workplace that matters. "Students' grasp of science as a process of discovery, and of mathematics as the language of scientific reasoning, is often formulaic, fragile, or absent altogether… Tests of scientific knowledge and classroom observation indicate that most science students spend much of their time learning definitions." The nature of science is embedded in inquiry-based learning. Students need to construct their own understanding by posing their own questions, designing and conducting investigations, and analyzing and communicating their findings.

Along with students, the teachers themselves must be involved with professional development in the STEM areas. If students are to have opportunities to develop high levels of scientific literacy, considerable emphasis will need to be placed on teacher development. Many primary and elementary teachers feel uncomfortable and unprepared to teach science. Many address insecurities by teaching as little science as possible, avoiding difficult topics, relying heavily on textbooks, using outside experts, and overemphasizing practical activity. The teaching pool in mathematics and science is inadequate to meet our current needs; many classes in these subjects are taught by unqualified and under qualified teachers resulting in newer, technologically oriented industries having trouble finding enough qualified employees from among those teachers' students. The most powerful predictors of higher student achievement in math and science are a full teacher certification and a college major in the field being taught. Yet nearly one in five high school science teachers lack even a minor in their main teaching field. About 56% of high school students taking science are taught by out-of-field teachers. Among schools with the highest minority enrollments, students have less than a 50% chance of getting a science teacher who holds both a license and a degree in the field. Under qualified teachers are most prevalent in urban schools.

Research has found that engaging teachers in learning environmental science positively impacted their understanding of inquiry learning, resulting in changing their classroom practice. We are in the process of developing effective inquiry-based and hands-on instructional materials and teacher training methods that take advantage of environmental themes, because when used as an integrating concept in pre-

school, elementary, and secondary education, it improves student interest, attitude, achievement, and attendance in school.

Identify Your Mission:
The mission of the Eastern Iowa Community Colleges is to deliver quality education and services to strengthen our community.

Our mission is accomplished by:
• Excelling in teaching and learning
• Identifying future needs
• Preparing tomorrow's workforce
• Promoting lifelong learning
• Fostering innovation
• Valuing diversity
• Committing to global sustainability
• Ensuring accessibility for all

EICC's mission and commitment to the community, coupled with the specific goals of their Interactive Learning Lab, compliments the goals of the STEM Hubs.

Identify Support:
EICC will commit to fund 50% of the salary of the Regional STEM Advocate as well as provide office space, furniture, computer and network access, email and all other needed office supplies/equipment/materials. The STEM Advocate will have access to additional EICC resources as needed and EICC and its partners commit to provide additional resources as necessary to ensure success.

Participating Organizations:
- Area Education Agency
- Nonprofit/informal learning centers
- Community College
- Economic development/Chamber of Commerce
- County Extension and Outreach
- K-12 student/parent
- Business/Industry
- Private college/university
- Public University
- Local government (e.g., elected official)
- Library
- STEM teacher
- School board member
- Regional workforce development
-Girl Scouts Molli Hermiston Molli Hermiston IMSAA
-L Math & Science Academy - Nicole Hoffman Nicole Hoffman [nhoffman@imsa.edu]
-JTM Concepts -Tracey Masamoto -Tracey Masamoto [tmasamoto@jtmconcepts.com]
-QC Elite Robotics -Michael LeGate-Michael LeGate [michaellegate@gmail.com]
-St Ambrose -Jodi Prosise -Prosise Jodi F [ProsiseJodiF@sau.edu]
-Western Illinois -Dr William Pratt wf-pratt@wiu.edu

-QC Grad Center -Grace Johnson grace@gradcenter.org
-Putnam Museum- Nichole Myles myles@putnam.org
-ASM - Cynthia Krist - Krist, Cynthia M. [Cynthia.Krist@alcoa.com]
-US Navy -Jay Flahertyjames.j.flaherty@navy.mil

Funding Assistance:
EICC has a strong history of securing federal and state funds through their Resource Development Office. EICCD is a public, state-funded, not-for-profit, comprehensive community college district comprised of three colleges that serve 22 school districts in eight counties with a population of 280,000. EICCD confers 61 two-year arts and science degrees, 80 career technology program diplomas and certificates, GED/ESL/ABE and non-credit offerings and served 11,609 credit and 56,496 non-credit students in FY 2009. EICCD has managed grants from U.S. funding agencies including the Environmental Protection Agency, Department of Education, Department of Energy, IMLS, the National Science Foundation and the Department of Labor. EICCD has successfully lead numerous federally funded collaborative grants with partners that include the Massachusetts Institute of Technology, University of Northern Iowa, and the National Renewable Energy Laboratory. In addition, EICCD has operated a successful National Science Foundation Advanced Technology Education Center since 1994 and managed over $18 million in funding to support Center activities.

EICCD currently manages a $71.8 million budget of which over $14.7 million are restricted Federal and State grants and contracts. Annual audits report no instances of noncompliance, no reportable conditions, and no compliance findings. EICCD has established procedures governing the administration of all special funds that comply with the fiscal and programmatic requirements of the Federal government, the state, and the institution. The system of internal accounting control assures that assets are safeguarded against loss from unauthorized use or disposition and transactions are executed and recorded in accordance with generally accepted accounting principles. EICCD hires an external auditing firm to audit all financial activities including grants, special projects, and restricted funds. The EICCD time management system includes the use of Personnel Action forms, Time Reports, and Time and Effort forms.

EICC will use the expertise of its staff to investigate funding opportunities and work to procure funds.

Additional Information:
For the last 18 years, the Eastern Iowa Community Colleges has housed the Advanced Technology Environmental and Energy Center (ATEEC), a National Science Foundation (NSF) Advanced Technology Education (ATE) Center of Excellence, established in 1994 with a mission to advance science, technology, engineering and math (STEM) focusing on environmental and energy technology education through curriculum development, professional development and program improvement in community colleges and secondary schools across the country. Since its inception, ATEEC has broadened its audience to grades K-14 and has become a local force in the development of STEM programs and K-12 teacher development as a way to lead students into associate and bachelor degree programs in STEM areas.

ATEEC is operated through Eastern Iowa Community College District (EICCD) and its partners: the Partnership for Environmental Technology Education (PETE) and the University of Northern Iowa (UNI). ATEEC has collaborated with industry partners including the Alliance for Global Sustainability (AGS), Aluminum Company of America (ALCOA), Interstate Renewable Energy Council (IREC), John Deere, and the National Renewable Energy Laboratory (NREL), as well as grant partnerships with the U.S. Environmental Protection Agency (EPA), U.S. Department of Labor (DOL), University of Wisconsin, U.S.

Department of Energy (DOE), U.S. Department of Agriculture (USDA), U.S. Education Department (DoE), Institute for Museum and Library Services (IMLS) and the Massachusetts Institute of Technology (MIT).

Subject Matter Expertise:

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Additional Considerations:

The South East Alliance for Modeling, Leading and Education STEM Students (SEAMLESS) is an existing, strong and dedicated partnership. This foundational strength ensures a truly collaborative and committed team able and ready to house and nurture a regional STEM Hub.